

REMARKS

In the Office Action, the Examiner rejected claims 1-4, 7, 12-14, 18, 22-29, 32, 36-45, and 47-56. The claims have been amended to further clarify the subject matter regarded as the invention. The claim rejections are fully traversed below. Claims 1-4, 7, 12-14, 18, 22-29, 32, 36-45, and 47-56 remain pending.

Reconsideration of the application is respectfully requested.

REJECTION OF CLAIMS UNDER 35 USC §103

In the Office Action, the Examiner rejected the claims under 35 USC §103 as being unpatentable over Rai et al, U.S. Patent No. 6,377,982 ('Rai' hereinafter) in view of Zhang et al, U.S. Patent No. 6,119,160 ('Zhang' hereinafter). This rejection is fully traversed below in view of the above claim amendments.

Applicant notes that Zhang is a newly applied reference. It is important to note that the pending case was filed on January 8, 1999. Since Zhang issued on September 12, 2000, it issued after the present case was filed. Therefore, Zhang can only be applied under 35 U.S.C. 102(e)/103, since Zhang was filed on October 13, 1998, before the January 8, 1999 filing date of the present case. Applicant respectfully submits that at the time the invention was made, both of these cases were subject to an obligation of assignment to Cisco Technology, Inc. As such, Zhang cannot be applied as prior art against the pending claims. However, even if Zhang were not subject to an obligation to assign to the same assignee as the present case, Applicant respectfully submits that the claims are patentable over the cited art, as set forth below.

As described in the Background section of Applicant's specification, the Mobile IP Management Information Base (MIB) defines a set of variables that can be examined or configured by a manager station. This accounting information is typically stored on the corresponding network device (e.g., Home Agent or Foreign Agent) and therefore each

network device may be periodically examined by the manager station. In other words, storage and updating of accounting information is typically dispersed among the network devices rather than stored at a centralized server. Although this information may be periodically polled by the manager station, this process is not dynamically performed (e.g., by a Home Agent or Foreign Agent). Moreover, such variables have not been implemented for the purposes of billing users associated with these mobile nodes. See Background section, pp. 3-4. Accordingly, the lack of centralization of accounting information in a Mobile IP environment typically requires substantial administrative overhead to poll the appropriate network devices (e.g., Home Agents or Foreign Agents).

In accordance with various embodiments of the invention as claimed in claim 1, an accounting request is sent to a centralized server by a network device (e.g., Home Agent or a Foreign Agent) to update accounting information associated with the mobile node. Since this information is centralized, it is possible to generate bills for a mobile node using the accounting information. The cited art, separately or in combination, neither discloses nor suggests the claimed invention. For instance, the cited art neither discloses nor suggests the use of a server that can receive accounting requests from various network devices (e.g., Home Agents and/or Foreign Agents) in order to record accounting information associated with various mobile nodes. Moreover, neither of the cited references, separately or in combination, discloses or suggests the administrative overhead resulting from a distributed system in which accounting information is stored among multiple network devices.

The Examiner cites Rai as the primary reference. Specifically, the Examiner cites col. 2, lines 63-67 and col. 3, lines 1-6 and 12-16 of Rai. Rai does disclose a foreign accounting collection module and a home accounting collection module. See col. 2, lines 63-67. Specifically, the home and serving accounting collection modules collect accounting data on message traffic transported between the end system and a communications server. See col. 3, lines 12-17. However, Rai neither discloses nor suggests maintaining accounting information for mobile nodes supported by a plurality of Home Agents. Moreover, Rai neither discloses nor suggests the type of data collected by the accounting collection modules, or the manner in which that information is sent to the accounting server, as claimed. In fact, Rai includes both a foreign accounting collection module and a home accounting collection module. See Abstract. Thus, accounting functions are distributed among multiple locations. As a result,

Rai teaches away from a centralized accounting server that supports a plurality of Home Agents.

It is important to note that, through the claimed invention, accounting information may be collected as a mobile node roams during a single session. Specifically, as recited in claim 1, the sending of an accounting request by a network device (e.g., Home Agent or Foreign Agent) is performed in response to a trigger event, where the trigger event is a lapse of a predetermined period of time, initiation or termination of a registration of the mobile node, or when a number of packets are received or sent by the mobile node. In other words, the trigger event is independent from the initiation (e.g. logon) or termination (e.g., log off) of a session. Stated another way, the claimed invention enables accounting information to be collected during a session.

Zhang discloses a method and apparatus for providing computer network access points having capability for multiple-level accounting. Specifically, a gateway device located at the access point generates Internet protocol accounting start and stop requests based on various events that need to be accounted for when a user accesses a network. These events include the user account logon, the service establishments and the PPP connections between the gateway device and public and private domains within the network. See Abstract. Thus, Zhang teaches initiating accounting when service is initiated (e.g., when a user logs on) and terminating accounting when service is terminated (e.g., when a user logs off). As such, Zhang teaches away from initiating and terminating accounting during a single session (e.g., independent of log on or log off).

It is important to note that Zhang's system is not a system operating under the Mobile IP Protocol. While billing may be performed for nodes that are not mobile, such methods may not be easily applied to mobile nodes operating under the Mobile IP Protocol. For instance, billing is often performed through the use of time stamps for nodes that are not mobile. For a node that is not mobile, this method is acceptable since only two time stamps, a START time stamp and a STOP time stamp for a given session, are required to determine a total service time. However, in a Mobile IP environment, each mobile node may roam to numerous Foreign Agents while communicating with a given corresponding node. The Home Agent (or access point) would therefore only see some of the packets associated with a session between the mobile node and the corresponding node. Thus, it may not know exactly when a session starts and stops. As disclosed in the Background section of Applicant's

specification, a time stamp such as a START and STOP time stamp as implemented in Zhang cannot be easily applied to mobile nodes operating under a Mobile IP Protocol. Accordingly, Zhang teaches away from a system in which accounting requests are used to update accounting information at a central server in a Mobile IP environment as a mobile node roams during a session.

It is also important to note that the events triggering the start and stop requests of Zhang include the user account logon, the service establishments and the PPP connections between the gateway device and public and private domains within the network. Thus, Zhang neither discloses nor suggests sending an accounting request in response to a trigger event, where the trigger event is a lapse of a predetermined period of time, initiation or termination of a registration of the mobile node, or when a number of packets are received or sent by the mobile node. In fact, the combination of the cited references, if used in a Mobile IP environment, would fail to achieve the desired result. Specifically, the transmission of an accounting start and stop request at user logon or logoff would be inoperable for the intended purpose (e.g., to maintain accounting information as a mobile node roams during a session). Accordingly, Applicant respectfully submits that claims are patentable over the cited references.

Accordingly, the cited art teaches away from the use of a system in which information is centralized at a server (e.g., AAA server) and updated through the use of accounting requests sent by network devices such as Home Agents and Foreign Agents in association with various Mobile Nodes supported by multiple Home Agents. Moreover, since the admitted prior art and Rai teaches accounting information distributed among Home Agents or Foreign Agents rather than centralized at a server supporting multiple Home Agents, the prior art teaches away from maintaining accounting information for a plurality of Home Agents at a central server as recited in claim 1, for example.

The claimed invention enables an accounting request to be sent under various circumstances (e.g., after a specific number of packets have been sent or received by a mobile node) where the accounting request includes at least one counter, indicating at least one of a number of packets or bytes sent or received by the mobile node, or a total service time. In this manner, a bill may be generated for this period of time or amount of information transmitted.

The dependent claims depend from one of the independent claims and are therefore patentable over the admitted prior art in view of the cited art for at least the same reasons. However, the dependent claims recite additional limitations that further distinguish them from the cited references. Hence, it is submitted that the dependent claims are patentable over the cited art.


Based on the foregoing, it is submitted that the independent claims are patentable over the cited references. In addition, it is submitted that the dependent claims are also patentable for at least the same reasons. The additional limitations recited in the independent claims or the dependent claims are not further discussed as the above discussed limitations are clearly sufficient to distinguish the claimed invention from the admitted prior art and the Mobile IP reference. Thus, it is respectfully requested that the Examiner withdraw the rejection of the claims under 35 USC §103(a).

SUMMARY

Reconsideration of the application and an early Notice of Allowance are earnestly solicited. If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. CISCPO77)

Respectfully submitted,
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